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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,159	12/06/2006	Veronique Sousa	290297US2PCT	3058
22850	7590	03/31/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ROLAND, CHRISTOPHER M	
			ART UNIT 2814	PAPER NUMBER
			NOTIFICATION DATE 03/31/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/577,159	<b>Applicant(s)</b> SOUSA ET AL.	
	<b>Examiner</b> CHRISTOPHER M. ROLAND	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-38 is/are pending in the application.
- 4a) Of the above claim(s) 26, 27, 30 and 34-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-25, 28, 29 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/17/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I, species c, **claims 20-25, 28, 29, and 31-33** in the reply filed on 8 January 2008 is acknowledged.
2. **Claims 26, 27, 30, and 34-38** are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method and species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8 January 2008.

### *Claim Objections*

3. **Claims 29 and 32** are objected to because of the following informalities: claims 29 and 32 introduce a new structural feature, "electrically insulating material." Additional structural features should be introduced by the phrase, "further comprising," and proper antecedent basis must be provided.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claim 21** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation wherein each passive outmost area is made in a material having a thermal conductivity less than or equal to that of the material of the electrical contact which is closest to it and/or to that of the material of the active central area. "And/Or" constitutes indefinite language as it is unclear whether thermal conductivity of the passive outmost area is being compared to the electrical contact or the active central area.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 20-23, 28, 29, and 31-33** are rejected under 35 U.S.C. 102(b) as being anticipated by Pryor et al. (US Patent 4,845,533, hereinafter Pryor '533).

With respect to claim 20, Pryor '533 teaches (FIG. 2) a phase-change memory cell as claimed, comprising:

between two electrical contacts (34 and 42), a portion in a memory material with an amorphous-crystalline phase-change and vice versa, as a stack with a central area located between two outmost areas (36, 38, and 40) (col. 9, ln. 20 – col. 12, ln. 66); and

an interface, inert or quasi-inert from a physico-chemical point of view (abstract; col. 1, ln. 24-29; col. 5, ln. 35-37; col. 15, ln. 45-66; col. 20, ln. 52-60), between the active central area (38) and each passive outmost area (36 and 40), each passive outmost area being made in a material having a melting temperature higher than that of the material of the active central area, the material of the outmost areas having very low solubility or zero solubility in the material of active central area (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 21, Pryor '533 teaches wherein each passive outmost area is made in a material having a thermal conductivity less than or equal to that of the material of the electrical contact which is closest to it and/or to that of the material of the active central area (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 22, Pryor '533 teaches wherein the passive outmost areas have, in a crystalline phase, an electrical resistance less than or equal to that of the active central area in a crystalline phase (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 23, Pryor '533 teaches wherein each passive outmost area is made in a material promoting a phenomenon of formation of crystalline germs in the active central area in proximity to the interface (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 28, Pryor '533 teaches wherein the passive outmost areas are made in a same material (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 29, Pryor '533 teaches wherein the active central area is at least partially confined laterally by electrically insulating material (70) (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 31, Pryor '533 teaches wherein at least one of the passive outmost areas and the active central area coincide laterally (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 32, Pryor '533 teaches wherein at least one of the passive outmost areas is bordered with electrically insulating material (70) (col. 9, ln. 20 – col. 12, ln. 66).

With respect to claim 33, Pryor '533 teaches a memory including a plurality of memory cells according to claim 20 as claimed (abstract; col. 1, ln. 24-29; col. 5, ln. 35-37; col. 9, ln. 20 – col. 12, ln. 66; col. 15, ln. 45-66; col. 20, ln. 52-60).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pryor '533 as applied to claim 20 above, and further in view of Sugawara (Japanese Patent Application Publication 2000-339750, hereinafter Sugawara '750).

With respect to claim 24, Pryor '533 teaches the device as described in claim 20 above with the exception of the additional limitation wherein each passive outmost area is made in a material substantially of the same chemical nature but with a different composition from those of the material of the active central area.

However, Sugawara '750 teaches (FIG. 1) a chalcogenide recording layer (14) between two interface controlling layers (13 and 15) comprising substantially of the same chemical nature but with a different composition from those of the material of the chalcogenide recording layer to attain stable reproducibility (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the passive outmost areas of Pryor '553 of substantially the same chemical nature but with a different composition from those of the material of the active central area as taught by Sugawara '750 to attain stable reproducibility.

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In re Leshin* (125 USPQ 416).

Within purview of one having ordinary skill in the art, it would have been obvious to select an optimum combination of materials from the given prior art listing. See *In re Aller, Lacey, and Hall* (10 USPQ 233-237).

7. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pryor '533 and Sugawara '750 as applied to claim 24 above, and further in view of Tanaka et al. (US Patent Application Publication 2004/0051161, hereinafter Tanaka '161).

With respect to claim 25, Pryor '533 and Sugawara '750 teach the device as described in claim 24 including the additional limitation wherein the material of each passive outmost area being antimony or antimony mixed with tellurium with a percentage ranging up to about 2%, these percentages being atomic percentages (Sugawara '750, abstract).

Thus, Pryor '533 and Sugawara '750 are shown to teach all the features of the claim with the exception of wherein the material of the active central area includes between about 16% and 30% of tellurium and between about 84% and 70% of antimony.

However, Tanaka '161 teaches a chalcogenide material (12) comprising between about 16% and 30% of tellurium and between about 84% and 70% of antimony ([0046]) as a recording layer in a non-volatile memory that can increase the possible number of data rewriting cycles while lowering power consumption ([0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the active central area of Pryor '533 and Sugawara '750 comprising between about 16% and 30% of tellurium and between about 84% and 70% of antimony as taught by Tanaka '161 as a recording layer in a non-volatile memory that can increase the possible number of data rewriting cycles while lowering power consumption.



Art Unit: 2814

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In re Leshin* (125 USPQ 416).

Within purview of one having ordinary skill in the art, it would have been obvious to determine the optimum concentrations of tellurium and antimony. See *In re Aller*, *Lacey*, and *Hall* (10 USPQ 233-237), "It is not inventive to discover optimum or workable ranges by routine."

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Klersy et al. (US Patent 5,177,567)

teaches a phase change memory device comprising a chalcogenide material between two inert contacts.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER M. ROLAND whose telephone number is (571)270-1271. The examiner can normally be reached on Monday-Friday, 8:00AM-5:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/577,159  
Art Unit: 2814

Page 10

/C. M. R./  
Examiner, Art Unit 2814

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